

WHAT IS CLAIMED IS:

1. A correlation circuit for spread spectrum communication for obtaining a correlation output from a spectrum-spread received signal, said circuit comprising:

an A/D converter for converting said received signal to a digital signal from an analog signal and sampling the signal;

a memory for storing an output from said A/D converter;

an input signal register, having a variable transfer speed of a shift, for shifting and outputting the input signal from said memory at a specified speed;

spread code registers, prepared for a necessary number of users, for shifting and outputting a generated spread code;

a sum of products calculator for multiplying and adding the input signal outputted from said input signal register and the spread code outputted from said spread code register at a specified number of times said sampling speed; and

a controller for: controlling the transfer speed of the shift of one sample in said input signal register in order to hold a sufficient time for completing calculation of a sum of products with respect to all a plurality of users in said sum of products calculator, when the plurality of users more than a specified number of users exist in the same phase

of the input signal from said memory; subsequently
controlling and setting said transfer speed to be higher than
said specified speed before compensating for a delay time
within one symbol, when the users less than said specified
5 number of users exist in the same phase; and controlling and
selecting the spread code to be outputted to said sum of
products calculator in accordance with the number of users in
the same phase.

10 2. The correlation circuit for spread spectrum
communication according to claim 1, comprising: a plurality
of A/D converters for a plurality of input signals;

a plurality of memories for said plurality of A/D
converters;

15 a plurality of input signal registers for said
plurality of memories, and

a selector section for selecting the output from
said plurality of input signal registers,

20 wherein the sum of products calculator multiplies
and adds the input signal selected by said selector section
and the spread code outputted from the spread code register
at the specified number of times the sampling speed.

25 3. The correlation circuit for spread spectrum
communication according to claim 2 wherein the controller
controls a shift timing in each input signal register to
deviate,

a register for holding the input signals outputted from said input signal register at different timings is disposed instead of the selector section, and

the sum of products calculator multiplies and adds the input signal held by the register and the spread code outputted from the spread code register at the specified number of times the sampling speed.

4. A correlation circuit for spread spectrum communication for obtaining a correlation output from a spectrum-spread received signal, said circuit comprising:

a plurality of A/D converters for converting said plurality of received signals to digital signals from analog signals and sampling the signals;

a memory for input signals in which a speed of an output timing is variable and which stores outputs from said plurality of A/D converters and outputs the selected input signal at the speed of a specified timing;

a memory for spread codes which stores a plurality of types of spread codes and outputs the selected spread code;

a sum of products calculator for multiplying and adding the input signal selectively outputted from said memory for the input signals and the spread code selectively outputted from the memory for the spread codes at a specified number of times a sampling speed; and

a controller for: controlling a timing for

outputting the input signal stored in said memory for the
input signals and the spread code stored in said
corresponding memory for the spread codes to said sum of
products calculator; controlling the speed of the output
5 timing from said memory for the input signals in order to
hold a sufficient time for completing calculation of a sum of
products with respect to all a plurality of users in said sum
of products calculator, when the plurality of users more than
said specified number of users exist in the same phase of the
10 input signal inputted in said memory for the input signals;
subsequently controlling and setting the speed of the output
timing from said memory for the input signals to be higher
than the speed of said specified timing before compensating
for a delay time within one symbol, when the users less than
15 said specified number of users exist in the same phase; and
controlling and selecting the spread code to be outputted to
said sum of products calculator in accordance with the number
of users in the same phase.

20 5. The correlation circuit for spread spectrum
communication according to any one of claims 1 wherein the
input signal register has a variable writing speed of data,
and successively writes and outputs the input signal from the
memory at the specified speed,

25 the spread code register is prepared for the
necessary number of users, and cyclically shifts and outputs
the generated spread code, and

the controller controls a cyclic shift in said spread code register in accordance with a writing position in the input signal register.

5 6. The correlation circuit for spread spectrum communication according to any one of claims 2 wherein the input signal register has a variable writing speed of data, and successively writes and outputs the input signal from the memory at the specified speed,

10 the spread code register is prepared for the necessary number of users, and cyclically shifts and outputs the generated spread code, and

15 the controller controls a cyclic shift in said spread code register in accordance with a writing position in the input signal register.

20 7. The correlation circuit for spread spectrum communication according to any one of claims 3 wherein the input signal register has a variable writing speed of data, and successively writes and outputs the input signal from the memory at the specified speed,

 the spread code register is prepared for the necessary number of users, and cyclically shifts and outputs the generated spread code, and

25 the controller controls a cyclic shift in said spread code register in accordance with a writing position in the input signal register.

8. The correlation circuit for spread spectrum communication according to any one of claims 4 wherein the input signal register has a variable writing speed of data, and successively writes and outputs the input signal from the memory at the specified speed,

the spread code register is prepared for the necessary number of users, and cyclically shifts and outputs the generated spread code, and

the controller controls a cyclic shift in said spread code register in accordance with a writing position in the input signal register.

9. The correlation circuit for spread spectrum communication according to any one of claims 1 wherein the sum of products calculator comprises a multiplier section for multiplying the input signal and the spread code, and an adder section for successively adding a multiplication result in a stepwise manner,

a plurality of outputs in the course of stepwise addition in said adder section can be selectively outputted as partial correlation outputs, and

the controller selects the partial correlation output in said adder section in accordance with a spread ratio of said spread code.

10. The correlation circuit for spread spectrum

communication according to any one of claims 2 wherein the sum of products calculator comprises a multiplier section for multiplying the input signal and the spread code, and an adder section for successively adding a multiplication result in a stepwise manner,

a plurality of outputs in the course of stepwise addition in said adder section can be selectively outputted as partial correlation outputs, and

the controller selects the partial correlation output in said adder section in accordance with a spread ratio of said spread code.

11. The correlation circuit for spread spectrum communication according to any one of claims 3 wherein the sum of products calculator comprises a multiplier section for multiplying the input signal and the spread code, and an adder section for successively adding a multiplication result in a stepwise manner,

a plurality of outputs in the course of stepwise addition in said adder section can be selectively outputted as partial correlation outputs, and

the controller selects the partial correlation output in said adder section in accordance with a spread ratio of said spread code.

12. The correlation circuit for spread spectrum communication according to any one of claims 4 wherein the

sum of products calculator comprises a multiplier section for multiplying the input signal and the spread code, and an adder section for successively adding a multiplication result in a stepwise manner,

5 a plurality of outputs in the course of stepwise addition in said adder section can be selectively outputted as partial correlation outputs, and

the controller selects the partial correlation output in said adder section in accordance with a spread ratio of said spread code.

10 13. The correlation circuit for spread spectrum communication according to any one of claims 1 wherein the sum of products calculator comprises a multiplier section for multiplying the input signal and the spread code, and an adder section for successively adding a multiplication result in a stepwise manner, and

the controller resets an adder for performing stepwise addition in the adder section in accordance with the spread ratio of the spread code.

20 14. The correlation circuit for spread spectrum communication according to any one of claims 2 wherein the sum of products calculator comprises a multiplier section for multiplying the input signal and the spread code, and an adder section for successively adding a multiplication result in a stepwise manner, and

the controller resets an adder for performing stepwise addition in the adder section in accordance with the spread ratio of the spread code.

5 15. The correlation circuit for spread spectrum communication according to any one of claims 3 wherein the sum of products calculator comprises a multiplier section for multiplying the input signal and the spread code, and an adder section for successively adding a multiplication result in a stepwise manner, and

10 the controller resets an adder for performing stepwise addition in the adder section in accordance with the spread ratio of the spread code.

15 16. The correlation circuit for spread spectrum communication according to any one of claims 4 wherein the sum of products calculator comprises a multiplier section for multiplying the input signal and the spread code, and an adder section for successively adding a multiplication result in a stepwise manner, and

20 the controller resets an adder for performing stepwise addition in the adder section in accordance with the spread ratio of the spread code.

25 17. The correlation circuit for spread spectrum communication according to any one of claim 1 wherein the sum of products calculator comprises the multiplier section

constituted of a plurality of multipliers for multiplying the input signal and the spread code, and a plurality of block adder sections for outputting the partial correlation outputs added by a unit of the specified number of multipliers in said multiplier section, and

the controller selects the partial correlation output from said block adder section in accordance with the spread ratio of said spread code, and adds said selected partial correlation outputs when there are a plurality of selected partial correlation outputs.

18. The correlation circuit for spread spectrum communication according to any one of claim 2 wherein the sum of products calculator comprises the multiplier section constituted of a plurality of multipliers for multiplying the input signal and the spread code, and a plurality of block adder sections for outputting the partial correlation outputs added by a unit of the specified number of multipliers in said multiplier section, and

the controller selects the partial correlation output from said block adder section in accordance with the spread ratio of said spread code, and adds said selected partial correlation outputs when there are a plurality of selected partial correlation outputs.

19. The correlation circuit for spread spectrum communication according to any one of claim 3 wherein the sum

of products calculator comprises the multiplier section constituted of a plurality of multipliers for multiplying the input signal and the spread code, and a plurality of block adder sections for outputting the partial correlation outputs added by a unit of the specified number of multipliers in said multiplier section, and

the controller selects the partial correlation output from said block adder section in accordance with the spread ratio of said spread code, and adds said selected partial correlation outputs when there are a plurality of selected partial correlation outputs.

20. The correlation circuit for spread spectrum communication according to any one of claim 4 wherein the sum of products calculator comprises the multiplier section constituted of a plurality of multipliers for multiplying the input signal and the spread code, and a plurality of block adder sections for outputting the partial correlation outputs added by a unit of the specified number of multipliers in said multiplier section, and

the controller selects the partial correlation output from said block adder section in accordance with the spread ratio of said spread code, and adds said selected partial correlation outputs when there are a plurality of selected partial correlation outputs.